

CLAIMS

1. The use, for the manufacture of paper coating colors, of a copolymer as an agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity, characterised in that the said copolymer is water soluble in a neutral or alkaline medium and in that it consists of copolymers composed of:
- 5 A) 25% to 45% by weight monomer units whose homopolymer has a Tg > 90°C,
B) 30% to 65% by weight anionic monomer units,
C) 0% to 30% by weight non-ionic monomer motives other than the monomers A),
D) 0% to 5% by weight cross-linking monomer units.
- 10 2. The use, for the manufacture of paper coating colors, of a copolymer according to Claim 1, characterised in that the said copolymer is water-soluble in a neutral or alkaline medium and in that it consists of copolymers composed of:
- 15 A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
- acrylamido methyl propane sulphonic acid or AMPS,
- ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
20 - sodium methallylsulphonate (MTAS) or allylsulphonate,
- itaconic acid,

- sodium styrene sulphonate,
- tetrahydrophthalic anhydride.

C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen from amongst acrylic or methacrylic acid esters or ethers, oxyalkylated monomers with
5 ethylenic non-saturation terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups having 1 to 50 carbon atoms and in particular the di-, tri- and tetrastyrylphenol groups or the nonylphenols, or chosen from amongst vinyl esters, allyl esters or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, unsaturated urethanes, acrylamides and methacrylamides, substituted or
10 not,

D) 0% to 5% by weight crosslinking monomer units chosen from amongst the monomers having at least two ethylenic non-saturations.

3. The use, for the manufacture of paper coating colors, of a copolymer according to Claim 2, characterised in that the said copolymer is water-soluble in a neutral or alkaline medium
15 and in that it consists of copolymers composed of:

- A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
- B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
 - acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,

- sodium styrene sulphonate,
- tetrahydrophthalic anhydride.
- C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen more particularly from amongst methyl, ethyl, butyl, 2-ethyl-hexyl, ethylene or propylene glycol acrylates or methacrylates, oxyethylated acrylates or methacrylates terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups with 1 to 50 carbon atoms and in particular the di-, tri- and tetrastyrylphenol groups, nonylphenols, vinyl acetate, allyl ethers or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, acrylurethanes, methacrylurethanes, α - α' dimethyl-m-isopropenylbenzyl urethane, allylurethane, acrylamides and methacrylamides, substituted or not.
- D) 0% to 5% by weight monomer units having at least two ethylenic non-saturations chosen from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetraallyloxyethane, the triallylcyanurates, the trivinylcyclohexane the allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose or others.
4. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:
- A) 25% to 45% by weight monomer units whose homopolymer has a $T_g > 90^\circ\text{C}$,
- B) 30% to 65% by weight anionic monomer units,
- C) 0% to 30% by weight non-ionic monomer motives other than the monomers A),
- D) 0% to 5% by weight cross-linking monomer units.

5. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity according to Claim 4, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:

- 5 A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene and their derivatives or methyl methacrylate,
- 10 B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
- acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates, phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,
 - sodium styrene sulphonate,
 - tetrahydrophthalic anhydride.
- 15 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen from amongst acrylic or methacrylic acid esters or ethers, oxyalkylated monomers with ethylenic non-saturation terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups having 1 to 50 carbon atoms and in particular the di-, tri- and tetrastyrylphenol groups, the nonylphenols, or chosen from 20 amongst vinyl esters, allyl esters or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, unsaturated urethanes, acrylamides and methacrylamides, substituted or not,
- D) 0% to 5% by weight of crosslinking monomer units chosen from amongst the monomers having at least two ethylenic non-saturations.

6. A novel agent for simultaneously adjusting the water retention of the coating color and its Brookfield viscosity according to Claim 5, characterised in that the said agent is a copolymer water-soluble in a neutral or alkaline medium and in that it is composed of:

- A) 25% to 45% by weight monomer units chosen from amongst styrene, α -methylstyrene
5 and their derivatives or methyl methacrylate,
- B) 30% to 65% by weight anionic monomer units chosen from amongst acrylic acid or methacrylic acid or their mixtures and possibly chosen from amongst:
- acrylamido methyl propane sulphonic acid or AMPS,
 - ethylene glycol or propylene glycol (meth)acrylate phosphates, sulphates,
10 phosphonates or sulphonates,
 - sodium methallylsulphonate (MTAS) or allylsulphonate,
 - itaconic acid,
 - sodium styrene sulphonate,
 - tetrahydrophthalic anhydride.
- 15 C) 0% to 30% by weight non-ionic monomer units other than the monomers A) chosen more particularly from amongst methyl, ethyl, butyl, 2-ethyl-hexyl, ethylene or propylene glycol acrylates or methacrylates, oxyethylated acrylates or methacrylates terminated by a chain, linear or branched, such as the linear or branched alkyl, aryl, alkylaryl or arylalkyl groups with 1 to 50 carbon atoms and in particular the di-, tri-
20 and tetrastyrylphenol groups or the nonylphenols, or even more particularly chosen from amongst vinyl acetate, allyl ethers or diisobutylene, vinylpyrrolidone, vinylcaprolactam, acrylonitrile, acrylurethanes, methacrylurethanes, α - α' dimethyl-m-isopropenylbenzyl urethane, allylurethane, acrylamides and methacrylamides, substituted or not.

- D) 0% to 5% by weight monomer units having at least two ethylenic non-saturations chosen from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetraallyloxyethane, the triallylcyanurates, the trivinylcyclohexane, the allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose or others.

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7. A paper coating color characterised in that it contains, in addition to the usual additives, the novel agent according to any one of Claims 4 to 6.

8. A paper coating color according to Claim 7, characterised in that it contains, in addition
10 to the usual additives, 0.1% to 2.0% by dry weight and preferentially 0.5% to 1.0% by dry weight, with respect to the dry weight of the fillers, of the novel agent according to any one of Claims 4 to 6.

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9. A paper coating color according to either one of Claims 7 or 8, characterised in that its water retention and Brookfield viscosity are adjusted simultaneously.

15 10. Paper and cardboard coated with the coating color according to any one of Claim 7 to 9.